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54 Title: COSMETIC OR DERMATOLOGICAL COMPOSITION IN THE FORM OF A GEL CONTAINING IN A MIXTURE AN ASSOCIATIVE COPOLYMER, A SURFACTANT AND AN INSOLUBLE CONDITIONING AGENT

57 Abstract

The invention concerns a cosmetic or dermatological composition for topical application in the form of an aqueous gel, containing (a) at least one associative copolymer selected among the non-cross-linked copolymers, of the acrylic type with hydrophobic chain, in a proportion of 0.8 to 20% by weight relative to the total weight of the composition; (b) at least one surfactant of the non-ionic type in a ratio of 1/20 to 1/5 relative to the associative copolymer, but present in a proportion less than 1% by weight relative to the total weight of the composition; and (c) at least one insoluble conditioning agent selected among a silicone, a hydrocarbon, a fatty alcohol or a fatty ester, said conditioning agent being present in a proportion of 0.01 to 20% by weight relative to the total weight of the composition. The composition in the form of an aqueous gel has an excellent texture, making it easy to grasp for its application on the skin or the hair.

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Cosmetic or dermatological composition in the form of a gel, containing in a mixture an associative copolymer, a surfactant and an insoluble conditioning agent.

The present invention has as its subject a cosmetic or dermatological composition for topical application, presented in the form of an aqueous gel containing at least one associative copolymer, at least one surfactant of the non-ionic type, and at least one insoluble conditioning agent chosen from among the silicones, hydrocarbons, fatty alcohols and fatty esters.

By the expression "associative copolymer" is understood, according to the invention, an amphiphilic copolymer containing both hydrophilic components and hydrophobic components.

The production of high viscosity gels starting from associative copolymers with a low proportion of surfactant is already known.

However, it had been observed that these gels, while they constituted good supports for various cosmetic and dermatological applications, nevertheless had a poor texture, making the gels difficult to take hold of by the users.

After various studies on these gels, it was surprisingly and unexpectedly observed that it was possible to improve their texture and thus render them more pleasant and easier to apply to the skin, and more particularly on the hair, by combining with them a certain percentage of an insoluble conditioning agent chosen from among the silicones, hydrocarbons, fatty alcohols and fatty esters.

It has in fact been observed that the improvement in the quality of the gels was clearly greater when a conditioning agent as defined above was used, compared for example to a natural oil such as a vegetable oil.

This improvement, moreover, turns out to result from the specific choice of the surfactant used. It was in fact observed that the use of other surfactants did not lead to satisfactory results with regard to the properties of the gels obtained.

The present invention thus has as its subject a cosmetic or dermatological composition for topical application, in the form of an aqueous gel containing:

- a) at least one associative copolymer chosen from among the non-crosslinked copolymers of the acrylic type with a hydrophobic chain, in a proportion of 0.8 to 20% by weight relative to the total weight of the composition,
- b) at least one surfactant of the non-ionic type in a proportion of 1/20 to 1/5 relative to the associative copolymer, but present in a proportion of less than 1% relative to the total weight of the compositions, and
- c) at least one conditioning agent chosen from among a silicone, a hydrocarbon, a fatty alcohol or fatty ester, the said conditioning agent being present in a proportion of 0.01 to 20% by weight relative to the total weight of the composition.

The gels according to the invention display visco-elastic behavior. They are preferably characterized by an angle of loss $\delta < 35$ and more particularly < 30 in the frequency range 10^{-2} at 10 Hz and by a value of the complex module $G^* < 200 \text{ N/m}^2$ in the frequency range 10^{-2} to 10 Hz, preferably by a value of the complex module $G^* > 100 \text{ N/m}^2$ at 10 Hz. The measurements are effectuated at 25°C using a rheometer with applied constraint (CARRIMED CSHR 100).

Preferably, the proportion of non-crosslinked copolymer of the acrylic type with a hydrophobic chain is between 1 and 10% by weight relative to the total weight of the composition.

By the expression "hydrophobic chain" is understood, according to the invention, a linear or branched alkyl or alkenyl chain having 8 to 32 carbon atoms.

Among the non-crosslinked copolymers of the acrylic type with a hydrophobic chain may be cited in particular those chosen from the group constituted by:

- (meth)acrylic acid/ethyl acrylate/ C_8 - C_{22} -alkyl acrylate copolymers such as the product "ACUSOL 823®, marketed by the ROHM & HAAS company and the product "IMPERON R®" by the HOECHST company;
- -(meth)acrylic acid/lauryl (meth)acrylate copolymers such as the "COATEX SX®" products marketed by the COATEX company;
- -(meth)acrylic acid/ C_1 - C_{22} -alkyl acrylate/polyethoxylated C_1 - C_{22} -alkyl allyl ether copolymers in which at least one of the monomers contains a C_8 - C_{22} -alkyl chain, such as the products "RHEOVIS-CR®," "RHEOVIS-CR₂®," RHEOVIS CR₃®," and RHEOVIS-CRX®" marketed by the ALLIED COLLOIDS company;
- the methacrylic acid/ethyl acrylate/polyoxyethylenated lauryl acrylate terpolymers such as the product "RHEO 2000®" marketed by the COATEX company;
- -(meth)acrylic acid/ethyl acrylate/polyoxyethylenated stearyl methacrylate copolymers such as the products "ACRYSOL 22®," "ACRYSOL 25®," and "DW-1206A®" marketed by the ROHM & HAAS company;
- -(meth)acrylic acid/ethyl acrylate/polyoxyethylenated nonylphenol acrylate copolymers such as the product "RHEO 3000®" marketed by the COATEX company;
- acrylic acid/polyoxyethylenated stearyl or cetyl monoitaconate copolymers or the acrylic acid/polyoxyethylenated cetyl monoitaconate copolymers such as the products "8069-72A®" and 8069-72B®" marketed by the NATIONAL STARCH company;
- (meth)acrylic acid/butyl acrylate/hydrophobic monomer containing a fatty chain copolymers such as the product "8069-146A®" marketed by the NATIONAL STARCH company;
- acrylic acid/ C_8 - C_{20} (preferably C_{19})-alkyl acrylate/polyethyleneglycol (preferably with 20 to 30 moles of ethylene oxide) acrylate terpolymers such as the product "DAPRAL GE 202®" marketed by the AKZO company;
- copolymers of (meth)acrylic acid/ (C_1-C_{22}) -alkyl acrylate/amphiphilic monomer containing a C_{8} -C₂₂-hydrocarbon chain (for example alkyl or alkenyl) containing urethane groups, such as the product "ADDITOL VXW 1312®" marketed by the HOECHST Company, and
- the acrylic polymers modified by hydrophobic groups with an aliphatic chain (C_8 - C_{22} hydrocarbon chain such as alkyl or alkenyl), such as the product "CS-0406®" marketed by the ROHM & HAAS company.

Of course, the copolymers described above can be used alone or in a mixture.

The surfactant of the non-ionic type according to the invention in the compositions according to the invention is preferably chosen from among the alcohols, alphadiols, alkylphenols or the fatty acids, the latter being polyethoxylated, polypropoxylated or polyglycerolated and having an aliphatic chain containing 8 to 28 atoms of carbon, the number of ethylene oxide or propylene oxide groups being capable of going from 2 to 50 and that of glycerol in particular from 2 to 30, the copolymers of the ethylene and propylene oxides, condensates of oxides of ethylene and propylene on to fatty alcohols, fatty amines or polyethoxylated amides preferably having 2 to 30 moles of ethylene oxide, polyglycerolated fatty amides having on the average 1 to 5 glycerol groups, polyglycerolated diglycolamides fatty acid esters of sorbitan, possibly oxyethylenated, fatty acid esters of saccharose, esters of polyoxyalkylenated fatty acids, alkylpolyglycosides, possibly oxyalkylenated, esters of alkylglucosides, derivatives of N-alkylglucamine and of N-acyl-methylglucamine, aldobionamides and amine oxides.

Among the particularly preferred surfactants of the non-ionic type may be cited in particular the esters of sorbitol and of C₈-C₂₂-fatty acids, possibly oxyethylenated, (C₈-C₂₂)-alkyl polyglucosides such as the product sold under the name "APG 300 GLYCOSIDES®" by the HENKEL company.

The surfactant of the non-ionic type can, according to the invention, possibly be combined with a surfactant of the anionic or amphoteric type.

Among the surfactants of the anionic type may be cited in particular salts, in particular alkaline salts, particularly of sodium, ammonium salts, amine salts, aminoalcohol salts or the magnesium salts of the following compounds: alkyl sulfates, alkylether sulfates, alkylamidoether sulfates, monoglyceride sulfates, alkylglyceryl sulfonates, alkyl sulfonates, alkyl phosphates, alkylamide sulfonates, alkylaryl sulfonates, alkylamide sulfosuccinates, alkylamide sulfosuccinates, alkylsulfosuccinates, alky

Among the surfactants of the amphoteric type may be cited the derivatives of secondary or tertiary aliphatic amines in which the aliphatic radical is a linear or branched chain containing 8 to 22 atoms of carbon and containing at least one hydrosolubilizing anionic group such as for example a carboxylate, sulfonate, sulfate, phosphate or phosphonate group. Also cited among the surfactants of the amphoteric or zwitterionic type are the sulfobetaines, alkylamidoalkyl betaines, alkylamidoalkyl sulfobetaines, imidazolium derivatives such as those of amphocarboxyglycinate or of amphocarboxypropionate.

By the expression "insoluble conditioning agent" according to the invention should be understood a silicone, hydrocarbon, fatty alcohol or fatty ester, insoluble or essentially insoluble in water (solubility less than 0.5% by weight).

When the conditioning agent in the composition according to the invention is a silicone, it is generally present in the composition according to the invention in a proportion of preferably between 0.05 and 5% by weight relative to the total weight of the composition.

The silicones or organopolysiloxanes used in the composition according to the present invention are organopolysiloxane oils or organic solutions or organosiloxane gums or resins.

Among the organosiloxanes used according to the present invention may be cited, in a non-limiting manner:

I. Volatile silicones

These have a boiling point of between 60°C and 260°C. Cited among this type of silicone are:

(i) cyclic silicones with 3 to 7 silicon atoms, and preferably 4 to 5. These involve, for example the octamethylcyclotetrasiloxane sold under the name "VOLATILE SILICONE 7207®" by the UNION CARBIDE company or "SILBIONE 70045 V2®" by the RHONE-POULENC company, the decamethylcyclopentasiloxane sold under the name "VOLATILE SILICONE 7158®" by the UNION CARBIDE company, "SILBIONE 70045 V5®" by the RHONE-POULENC company, as well as their mixtures.

Also cited are the copolymers of the dimethylsiloxane/methylalkylsiloxane type, such as the "SILICONE VOLATILE FZ 3109®" sold by the UNION CARBIDE company, which is a dimethylsiloxane/methylacetylsiloxane cyclocopolymer;

(ii) the linear volatile silicones having 2 to 9 atoms of silicon and possessing a viscosity less than or equal to 5.10-6 m²/sec at 25°C. This includes, for example, the hexamethyldisiloxane sold under the name "SILBIONE 70041 VO,65®" by the RHONE POULENC company. This type of product is described in the article by Todd and Byers, "Volatile silicone fluids for cosmetics," Cosmetics and Toiletries, Vol. 91, Jan. 1976, pages 27-32.

II. Non-volatile silicones

These are constituted mainly by the polyalkylsiloxanes, polyarylsiloxanes, polyalkylarylsiloxanes, silicone gums and resins and organo-modified polysiloxanes, as well as their mixtures.

Among the polyalkylsiloxanes may be cited principally the linear polydimethylsiloxanes of viscosity above 5.10-6 m²/sec, and preferably below 2.6 m²/sec, that is:

- with terminal trimethylsilyl groups, such as for example, and in a non-limiting manner, the "SILBIONE®" oils of the 70047 series, marketed by the RHONE POULENC company, the oil "47 V 500.000®" of RHONE POULENC or certain "VISCASIL®" from the GENERAL ELECTRIC company.
- with terminal trihydroxysilyl groups, such as the oils of the "48-V®" series from the RHONE POULENC company.

In this class of polyalkylsiloxanes may also be mentioned the polyalkylsiloxanes sold by the GOLDSCHMIDT company under the name "ABILWAX 9800®" and "ABILWAX 9801®" which are poly- (C_1-C_{20}) -alkylsiloxanes.

Among the polyalkylarylsiloxanes may be cited the polydimethylphenylsiloxanes, the linear and/or branched polydimethyldiphenylsiloxanes of viscosity 10⁻⁵ to 5.10⁻² m²/sec at 25°C, such as for example:

- the oil "RHODORSIL®" 763 from RHONE POULENC,
- the "SILBIONE® oils of the 70641 series from RHONE POULENC, such as "SILBIONE 70641 V30®" and "SILBIONE 70641 V200®" from RHONE POULENC,
 - the product "DC 556®" Cosmetic Grade Fluid from DOW CORNING,

- the silicones of the PK series from BAYER, such as "PK20®,"
- the silicones of the PN, PH series from BAYER, such as the "PN 1000®" and PH 1000®,"
- certain oils of the SF series from GENERAL ELECTRIC, such as the "SF 1250®," "SF 1265®," "SF 1154®," "SF 1023®".

The silicone gums in conformity with the present invention, are polydiorganosiloxanes of high molecular mass, averaging between 200,000 and 1,000,000, used alone or in a mixture in a solvent chosen from among the volatile silicones, the polydimethylsiloxane oils (PDMS), the polyphenylmethylsiloxane oils (PPMS), isoparaffins, methylene chloride, pentane, dodecane, tridecane, tetradecane or their mixtures.

The following compounds may be cited, for example:

- poly[dimethylsiloxane)/(methylvinylsiloxane)],
- poly[dimethylsiloxane)/(diphenylsiloxane)],
- poly[dimethylsiloxane)/(phenylmethylsiloxane)],
- poly[dimethylsiloxane)/(diphenylsiloxane)/ (methylvinylsiloxane)].

The following mixtures may be cited as non-limiting examples:

- 1) the mixtures formed from a polydimethylsiloxane hydroxylated at the end of the chain (DIMETHICONOL according to the CTFA nomenclature), and a cyclic polydimethylsiloxane (CYCLOMETHICONE according to the CTFA nomenclature), such as the product "Q2 1401®" sold by the DOW CORNING company;
- 2) the mixtures formed from a polydimethylsiloxane gum with a cyclic silicone, such as the product "SF 1214 SILICONE FLUID®" from GENERAL ELECTRIC, which is an "SE 30®" gum of MW 300,000 (Mn) solubilized in "SF 1202 SILICONE FLUID®" (decamethyl-cyclopentasiloxane);
- 3) the mixtures of two PDMS of different viscosities, in particular a PDMS gum and a PDMS oil, such as the products "SF 1236®" and "CF 1241®" from the GENERAL ELECTRIC company. The product "SF 1236®" is the mixture of an "SE 30®" gum defined above, of a viscosity of 20 m²/sec, and an "SF 96®" oil of viscosity 5.10⁻⁶ m²/sec (15% "SE 30®" gum and 85% "SF 96®" oil).

The product "CF 1241®" is the mixture of an "SE 30®" gum (33%) and a PDMS (67%) of viscosity 10⁻³ m²/sec.

The organopolysiloxane resins that can be used according to the invention are the crosslinked siloxanic systems containing the units: $R_2SiO_{2/2}$, $RSiO_{3/2}$ and $SiO_{4/2}$ in which R represents a hydrocarbon group with 1 to 6 atoms of carbon or a phenyl group. Among these products, those particularly preferred are those in which R designates a lower alkyl radical or a phenyl radical.

Among these resins may be cited the product sold under the name "DOW CORNING 593®" or those sold under the names "SILICONE FLUID SS 4230" and "SILICONE FLUID SS 4267" by the GENERAL ELECTRIC company and which are dimethyl/trimethylpolysiloxanes.

The organo-modified silicones according to the present invention are silicones as defined previously, including in their general structure one or more organofunctional groups fixed directly on the siloxane chain or fixed by the intermediary of a hydrocarbon radical.

Cited for example are the silicones containing:

- a) perfluoro groups such as trifluoroalkyls, such as for example those sold by the GENERAL ELECTRIC company under the names "FF.150 FLUOROSILICONE FLUID®" or by the SHIN ETSU company under the names "X-22-819®," "X-22-82®," "X-22-821®," and "X-22-822®";
- b) hydroxyacylamino groups such as for example those described in the patent application EP-A-0 342 834 and in particular the silicone sold by the DOW CORNING company under the name "Q2-8413®";
- c) thiol groups as in the "X 2-8306®" silicones from the DOW CORNING company or "GP 72A®" and "GP 71®" from GENESEE;
- d) substituted or unsubstituted amino groups such as in "GP 4 SILICONE FLUID®" from GENESEE, "GP 7100®" from GENESEE, "Q2 8220®" from DOW CORNING, "AFL 40®" from UNION CARBIDE or the silicone called "Amodimethicone" in the CTFA dictionary;
- e) carboxylate groups, such as the products described in the patent EP 186 507 of CHISSO CORPORATION;
- f) hydroxylated groups, such as the polyorganosiloxanes with hydroxyalkyl function described in the patent application Fr-85 16334, corresponding to the following formula:

$$(R_1)_{\frac{1}{2}}\operatorname{Si} = \begin{bmatrix} R_1 \\ 0 \\ R_1 \end{bmatrix} = \begin{bmatrix} 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \\ 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \end{bmatrix} = \begin{bmatrix} 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \\ 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \end{bmatrix} = \begin{bmatrix} 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \\ 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \end{bmatrix} = \begin{bmatrix} 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \\ 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \end{bmatrix} = \begin{bmatrix} 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \\ 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \end{bmatrix} = \begin{bmatrix} 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \\ 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \end{bmatrix} = \begin{bmatrix} 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \\ 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \end{bmatrix} = \begin{bmatrix} 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \\ 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \end{bmatrix} = \begin{bmatrix} 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \\ 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \end{bmatrix} = \begin{bmatrix} 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \\ 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \end{bmatrix} = \begin{bmatrix} 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \\ 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \end{bmatrix} = \begin{bmatrix} 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \\ 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \end{bmatrix} = \begin{bmatrix} 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \\ 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \end{bmatrix} = \begin{bmatrix} 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \\ 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \end{bmatrix} = \begin{bmatrix} 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \\ 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \end{bmatrix} = \begin{bmatrix} 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \\ 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \end{bmatrix} = \begin{bmatrix} 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \\ 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \end{bmatrix} = \begin{bmatrix} 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \\ 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \end{bmatrix} = \begin{bmatrix} 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \\ 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \end{bmatrix} = \begin{bmatrix} 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \\ 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \end{bmatrix} = \begin{bmatrix} 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \\ 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \end{bmatrix} = \begin{bmatrix} 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \\ 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \end{bmatrix} = \begin{bmatrix} 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \\ 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \end{bmatrix} = \begin{bmatrix} 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \\ 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \end{bmatrix} = \begin{bmatrix} 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \\ 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \end{bmatrix} = \begin{bmatrix} 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \\ 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \end{bmatrix} = \begin{bmatrix} 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \\ 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \end{bmatrix} = \begin{bmatrix} 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \\ 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \end{bmatrix} = \begin{bmatrix} 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \\ 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \end{bmatrix} = \begin{bmatrix} 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \\ 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \end{bmatrix} = \begin{bmatrix} 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \\ 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \end{bmatrix} = \begin{bmatrix} 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \\ 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \end{bmatrix} = \begin{bmatrix} 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \\ 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \end{bmatrix} = \begin{bmatrix} 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \\ 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \end{bmatrix} = \begin{bmatrix} 0 - \operatorname{Si}(R_1)_{\frac{1}{2}} \\$$

in which:

- the radicals R_1 , which are identical or different, are chosen from among the methyl and phenyl radicals, at least 60 mole % of the R_1 radicals being methyl;
 - the R'₁ radical is a C₂-C₁₈ hydrocarbon divalent alkylene chain link;
 - p is between 1 and 30, inclusive;
 - q is between 1 and 150, inclusive;
- g) alkoxylated groups as in the silicone copolymer "F 755®" from SWS SILICONES and the products "ABILWAX 2428®," "ABILWAX 2434®," "ABILWAX 2440®" from the GOLDSCHMIDT company;
- h) acyloxyalkyl groups, such as for example the polyorganopolysiloxanes described in the patent application FR 88 17433, corresponding to the following formula:

$$(R_2)_{\frac{1}{3}}Si = \begin{bmatrix} R'_2 \\ O-Si \\ R \\ OCOR'' \\ D \\ OH \end{bmatrix}_{q} \begin{bmatrix} R'_2 \\ O-Si \\ R'_2 \\ O-Si \\ R'_2 \end{bmatrix}_{r} O-Si(R_2),$$
 (II

in which:

- R₂ designates methyl, phenyl, OCOR", hydroxyl, and only one of the R₂ per atom of silicon can be OH;
- R'_2 designates methyl, phenyl, and at least 60 mole % of the total of the R_2 and R'_2 radicals is methyl;
 - R" designates C₈-C₂₀ alkoyl or alkenyl;
 - R designates a linear or branched C₂-C₁₈ divalent alkylene hydrocarbon;
 - r is between 1 and 120 inclusive;
 - p is between 1 and 30, inclusive;
 - q is 0 or is less than 0.5 p, p + q being between 1 and 30 inclusive;

the polyorganosiloxanes of formula (II) can contain CH₃-Si-OH

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groups in proportions not exceeding 15% of the sum of p + q + r;

- i) quaternary ammonium groups, as in the products "X2 81 08®" and "X2 81 09®," and the product "ABIL K 3270®" from the GOLDSCHMIDT company;
- j) amphoteric or betaine groups, such as in the product sold by the GOLDSCHMIDT company under the name "ABIL B 9950®";
- k) bisulfite groups, such as in the products sold by the GOLDSCHMIDT company under the names "ABIL S 201®" and ABIL S 255®";

The polyorganosiloxanes particularly preferred according to the present invention are chosen from among:

- 1) the non-volatile silicones of the linear polyalkylsiloxane type with terminal trimethylsilyl groups such as the "SILBIONE®" oils of the 70047 and 47 series, such as the oil "47 V 500,000®" marketed by the RHONE POULENC company or of the polyalkylarylsiloxane type such as the oil "SILBIONE 70641 V 200®" from the RHONE POULENC company;
- 2) mixtures of organosiloxanes and cyclic silicones such as "Q2 1401®" from the DOW CORNING company, "SF 1214 SILICONE FLUID®" from the GENERAL ELECTRIC company;
- 3) fluorosilicones of the polyalkylsiloxane type with terminal trimethylsilyl groups and substituted on the chain by trifluoropropyl groups, such as the fluorosilicone sold by the SHIN ETSU company under the name "X-22-821®."

When the conditioning agent in the composition according to the invention is a hydrocarbon, it can be a linear or branched C_8 - C_{300} hydrocarbon. Among the hydrocarbons liquid at ambient temperature corresponding to this definition may be cited in particular isododecane, isohexadecane and its isomers (such as 2,2,4,4,6,6-heptamethylnonane [sic]), isoeicosane, isotetracosane, and the isomers of the said compounds. Preferably used according to the invention are isododecane or one of its isomers.

When the conditioning agent is a fatty alcohol, it is of the linear or branched, saturated or unsaturated C_8 - C_{22} type, and among these may be cited 2-butyl-octanol, lauryl alcohol, oleyl alcohol, isocetyl alcohol and isostearyl alcohol.

When the conditioning agent is a fatty ester, the latter can be either an ester of a C_8 - C_{22} -fatty acid and a C_1 - C_{22} -alcohol, or an ester of a C_1 - C_7 acid or diacid and a C_8 - C_{22} -fatty alcohol. Among these esters may be cited ethyl, isopropyl, 2-ethylhexyl and 2-octyldecyl palmitate, isopropyl, butyl, cetyl, and 2-octyldecyl myristate, butyl and hexyl stearate, hexyl and 2-hexyldecyl laurate, isononyl isononanoate and dioctyl malate.

The hydrocarbons, fatty alcohols or fatty esters and their mixtures, like the silicones, are preferably present in a proportion of between 0.05 and 5% by weight relative to the total weight of the composition.

Into the compositions in the form of aqueous gels according to the invention may be introduced various active substances having cosmetic or dermo-pharmaceutical interest.

Among these active substances may be cited as examples:

- agents modulating cutaneous differentiation and/or proliferation and/or pigmentation, such as retinoic acid and its isomers, retinol and its esters, vitamin D and its derivatives, estrogens such as estradiol, kojic acid or hydroquinone;
- antibacterials or antibiotics, antiparasitics, antifungals, antiviral agents, steroidal antiinflammatory agents or non-steroidal antiinflammatory agents, substances such as substance P antagonists, CGRP or bradykinin or NO-synthase inhibitors, anesthetic agents and antipruriginous agents.

Other active substances that can be cited are:

- keratolytic agents such as α and β -hydroxycarboxylic or β -ketocarboxylic acids, their salts, amides or esters, and more particularly the hydroxyacids such as glycolic acid, lactic acid, salicylic acid, citric acid and in general fruit acids and n-octanoyl-5-salicylic acid;
- anti-free radical agents, anti-seborrheic agents, anti-acne agents, derivatives of pyrimidine such as 2,4-diamino-6-piperidinopyrimidine 3-oxide or "MINOXIDIL" or its many derivatives, agents favoring the regrowth of hair such as those described in the patent application EP 0648488, calcium or hormone antagonist agents, or anti-androgenic agents.

The compositions according to the invention can also contain various adjuvants used particularly in cosmetics such as perfumes, preservatives, sunscreens, sequestrants, colorants, acidifying or alkalizing agents, hydrating or emollient agents, reducing agents, oxidizing agents, non-oily hair or skin conditioning agents, as well as other adjuvants depending on the use envisaged.

Several examples of the composition according to the invention will now be given as an illustration.

EXAMPLES

Example 1: No-rinse gel

A non-rinse gel is prepared by mixing the following ingredients:

- acrylic acid/C₁-C₁₈ alkyl acrylate/ polyoxyethylenated stearyl methacrylate

terpolymer with 20 moles ethylene oxi marketed under the name "ACRYSOL by the ROHM & HAAS company	ICS-1®"	1.0 g	
- oxyethylenated lauric ester of sorbitol with 20 moles ethylene oxide (Tween 20)			
- 2-butyl-octanol (Isofol 12)		2.0 g	
- 2-amino-2-methyl-1-propanol	qs pH 7.5		
- water	qsp	100.0 g	
The gel obtained has an excellent texture and is particularly easy to apply to the hair.			
Example 2: No-rinse gel			
- acrylic acid/C ₁ -C ₁₈ alkyl acrylate/ polyoxyethylenated stearyl methacrylate terpolymer with 20 moles ethylene oxide, marketed under the name "ACRYSOL ICS-1®" by the ROHM & HAAS COMPANY			
- decyl polyglucose marketed under the name "APG 300 GLYCOSIDE®" by the HENKEL company			
- α,ω-di-OH polydimethylsiloxane in 14% solution in the mixture cyclotetra/ cyclopentadimethylsiloxane ("Q2-1401®" from DOW CORNING)			
- 2-amino-2-methyl-1-propanol	qs pH 7.5		
- water	qsp	100.0 g	
Example 3: No-rinse gel			
- (meth)acrylic acid/C ₈ -C ₂₂ alkyl acrylate/ polyoxyethylenated C ₁ -C ₂₂ alkyl allyl ether terpolymer marketed under the name "RHEOVIS-CR®" by the ALLIED COLLOIDS company			
- decyl polyglucose marketed under the name "APG 300 GLYCOSIDE®" by the HENKEL company			
- polydimethylsiloxane of viscosity 500 cst marketed under the name "MIRASIL DM 500®" by the RHONE POULENC company 3.0 g			
- 2-amino-2-methyl-1-propanol	qs pH 7.5		
- water	qsp	100.0 g	

Example 4: no-rinse gel

- methacrylic acid/polyoxyethylenated marketed under the name "RHEO 30	00®" by the COATEX	
- oxyethylenated lauric ester of sorbitol with 20 moles ethylene oxide (Tween	i	
- isohexadacane	······································	2.0 g
- 2-amino-2-methyl-1-propanol	qs pH 7.5	
- water	qsp	100.0 g

CLAIMS

- 1. Cosmetic or dermatological composition for topical application in the form of an aqueous gel, characterized by the fact that it contains:
- a) at least one associative copolymer chosen from among the non-crosslinked copolymers of the acrylic type with a hydrophobic chain, in a proportion of 0.8 to 20% by weight relative to the total weight of the composition,
- b) at least one surfactant of the non-ionic type in a proportion of 1/20 to 1/5 relative to the associative copolymer, but present in a proportion below 1% by weight relative to the total weight of the composition, and
- c) at least one conditioning agent chosen from among a silicone, hydrocarbon, fatty alcohol or fatty ester, the said conditioning agent being present in a proportion of 0.01 to 20% by weight relative to the total weight of the composition.
- 2. Composition as in claim 1, characterized by the fact that the proportion of non-crosslinked copolymer of the acrylic type with a hydrophobic chain is between 1 and 10% by weight relative to the total weight of the composition.
- 3. Composition as in one of the preceding claims, characterized by the fact that the said non-crosslinked copolymer of the hydrophobic chain acrylic type is chosen from the group constituted by:
 - (meth)acrylic acid/ethyl acrylate/C₈-C₂₂ alkyl acrylate copolymers;
 - (meth)acrylic acid/lauryl (meth)acrylate copolymers;
 - (meth)acrylic acid/ C_1 - C_{22} -alkyl acrylate/polyethoxylated C_1 - C_{22} -alkyl allyl ether copolymers in which as least one of the monomers contains a C_8 - C_{22} -alkyl chain;
 - methacrylic acid/ethyl acrylate/polyoxyethylenated lauryl acrylate terpolymers;
 - (meth)acrylic acid/ethyl acrylate/polyoxyethylenated stearyl methacrylate copolymers;
 - -(meth)acrylic acid/ethyl acrylate/polyoxyethylenated nonylphenyl acrylate copolymers;
 - acrylic acid/polyoxyethylenated stearyl or cetyl monoitaconate copolymers;

- copolymers of (meth)acrylic acid/butylacrylate/ hydrophobic monomer containing a fatty chain;
- acrylic acid/C₈-C₂₀ polyethyleneglycol acrylate terpolymers;

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- copolymers of (meth)acrylic acid/C₁-C₂₂-alkyl acrylate/amphiphilic monomer containing a C₈-C₂₂-hydrocarbon chain, and
- acrylic polymers modified by aliphatic chain hydrophobic groups.
- 4. Composition as in any one of the preceding claims, characterized by the fact that the said surfactant of the non-ionic type is chosen from among the esters of sorbitol and C₈-C₂₂- fatty acids, possibly oxyethylenated, and the alkylpolyglucosides.
- 5. Composition as in any one of the preceding claims, characterized by the fact that it contains in addition at least one anionic and/or amphoteric surfactant.
- 6. Composition as in any one of the preceding claims, characterized by the fact that the silicone is of the volatile type having a boiling point of between 60°C and 260°C.
- 7. Composition as in any one of the claims 1 to 5, characterized by the fact that the silicone is of the non-volatile type and is chosen from among the polyalkylsiloxanes, polyarylsiloxanes, polyalkylarylsiloxanes, silicone gums and resins and organo-modified polysiloxanes and their mixtures.
- 8. Composition as in any one of the claims 1 to 5, characterized by the fact that the hydrocarbon is a linear or branched, cyclic or acyclic C₈-C₃₀₀ hydrocarbon.
- 9. Composition as in claim 8, characterized by the fact that the hydrocarbon is chosen from among isododecane, isohexadecane and its isomers, isoeicosane, isotetracosane and their isomers.
- 10. Composition as in any one of the claims 1 to 5, characterized by the fact that the fatty alcohol is a linear or branched, saturated or unsaturated C_8 - C_{22} alcohol.
- 11. Composition as in claim 10, characterized by the fact that the fatty alcohol is chosen from among 2-butyl-octanol, lauryl alcohol, oleyl alcohol, isocetyl alcohol, and isostearyl alcohol.
- 12. Composition as in any one of the claims 1 to 5, characterized by the fact that the fatty ester is an ester of a C₈-C₂₂-fatty acid and a C₁-C₂₂-fatty alcohol or an ester of a C₁-C₇ acid or diacid and a C₈-C₂₂ fatty alcohol.
- 13. Composition as in claim 12, characterized by the fact that the fatty ester is chosen from among ethyl, isopropyl, 2-ethylhexyl and 2-octyldecyl palmitate, isopropyl, butyl, cetyl and 2-cetyldecyl myristate, butyl and hexyl stearate, hexyl and 2-hexyldecyl laurate, isononyl isononanoate, and dioctyl malate.
- 14. Composition as in any one of the preceding claims, characterized by the fact that it contains in addition at least one adjuvant chosen from among the perfumes, preservatives, sunscreens, sequestrants, hydrating or emollient agents, reducing agents, oxidizing agents, non-oily conditioners for the hair or skin, colorants and acidifying or alkalinizing agents.